Jeremy Quillin

LBSC

Literature Review

When analyzing the effectiveness of games in education, it is important to define what a game is and how it becomes an instructional video game. Games are inherently simplifications of reality, and today’s games often incorporate violent and sometimes misogynistic themes (Squire 2003). Critics suggest that the lessons people learn from playing video games as they currently exist are not always desirable, but even the harshest critics agree that we learn something from playing video games (Squire 2003). What then makes a video game instructional for use in the classroom? Research suggests that a video game must contain several elements in order to become instructional. These programs must include the elements of a challenge, fantasy, curiosity, and goals (Rosas 2002). Sugarman (2006) adds to these elements by stating that these games should also require the elements of mystery and skill. Also, Quinn (1994) argues that for games to benefit educational practice and learning, they need to combine fun elements with aspects of instructional design and system design, which also includes motivational, learning and interactive components. Squire (2003) argues that video games that are immersed in genres such as simulations, strategy, role playing, sports, puzzles, and adventures enable users to better interact in rich, interactive digital micro worlds. Adding to the definition of games, Cruickshank (2001) offers to further divide the definition of games into simulations. Cruickshank defines that a simulation is a product that results when one creates the appearance or effect of something else. Squire (2004) defines games as virtual worlds because they make it possible to develop situated understanding. Oblinger (2004) goes further to explain that just as games have different styles, so do the game players. Oblinger has described four types of game players; committed gamers, wanna be’s, fun seekers, and time killers.

Key components that encourage video game use in the classroom

Until recently, games have mostly been ignored by many educational professionals. Now games are no longer for wasting time; they offer a potentially powerful learning environment (Facer 2002). Scientists call it the next great discovery, a way to captivate students so much they will spend hours learning on their own. (Feller 2007).There are many attributes of games that make them pedagogically sound learning environments (Oblinger 2004). Because today’s students are diverse in their learning styles and technology experiences, video games have the potential to meet the growing needs of this diverse population (Cook 2007). This day and age many students are technology savvy and find technology interesting and useful. Oblinger (2004) illustrates a study on games and college students which found that games such as computer, video, and online games are intertwined into everyday college life. Literature that includes surveys show that students who use games find that difficult tasks can be engaging and amusing when incorporated in a story and a meaningful context (Facer 2002). In another survey, students said motivation and a sense of meaningfulness are aspects they appreciate about the games, and these in turn make learning more efficient (Oblinger 2004).

Facer (2002) offers probably the most dominant proposition to gaming in the classroom by stating that the over-riding reason for interest in this field is that computer games seem to motivate young people in a way that formal education doesn’t. Facer furthers this argument by stating that the desire to harness this motivational power to encourage young people to want to learn is the main driver behind an interest in computer games for learning (Facer, 2002). According to Prensky (2003), a motivated learner cannot be stopped, and that most teachers lack a great deal of student motivation. According to Oblinger (2004), games offer advantages in terms of motivation; Oblinger states that students are often motivated to learn material (math) when it is required for successful game play, that same material might otherwise be considered tedious.

Prensky (2003) furthers his support of games by making the argument that it makes a great deal of sense to try to merge the content of learning and the motivation of games. Squire (2003) argues that video games are powerful contexts for learning because they make it possible to create virtual worlds, and because acting in such worlds makes it possible to develop the situated understandings, effective social practices, powerful identities, shared values, and ways of thinking of important communities practice. According to Cruickshank (2001), some advantages of games in the classroom include; guaranteeing like experiences, solving problems themselves, illustrating real-life situations, being psychologically engaging, and being enjoyable. Baird & Silvern (1990) Argue that video games should be used as an instructional tool because they also posses the positive elements found in computer games in general, and add value in that they create a micro world of their own, which players act on based on their natural tendencies towards learning (Rieber, 1996).

Research has shown that video games can benefit students socially. Video game playing occurs in rich socio-cultural contexts, bringing friends and family together, serving as an outlet for adolescents, and providing the “raw material” for youth culture Squire (2004). Squire continues his stance on the social benefit by expressing that video game playing occurs in social contexts; video game playing is not only a child (or group) of children in front of a console, it is also children talking about a game on the school bus, acting out scenes from a game on the playground, or discussing games on an online bulletin board. Ellis (1983) argues that video games are the building blocks of children’s worlds, which include stories and characters. Oblinger (2004) argues that the reality is that games are highly social. Students play games in groups and against others. These games encourage collaboration among players as well as providing a context for peer-to-peer teaching for the emergence of learning communities (Oblinger 2004). This kind of critical engagement with games can resemble with educational psychologist call meta-cognition, the process of reflecting on learning itself (squire, 2003). Literature suggests that cultural critics should hesitate before dismissing the competitive nature of most video games as unhealthy (Jenkins 1998). This argument is reinforced by the idea that assertiveness is a socially redeeming quality of which is promoted in video games (Graybill 1987). Squire (2003) suggests that educators could benefit by studying these communities that form around gaming, in order to understand what non-game elements contribute to the engaging activity that is video gaming.

Some literature expresses the importance of video games in the influence of the technology field (Subrahmanyam & Greenfield 1998) . The positive effects of video games is further analyzed by indicated that video game players learn to interact with digital technology at an early age, which developing technological literacy which can serve them later in a digital economy (Subrahmanyam & Greenfield 1998). Subrahmanyam and Greenfield 1998 further their advocacy for video game use by stating that there is substantial antidotal evidence that video game playing often leads to a fascination with technology, which they believe will lead students to an interest in technology related fields.

Research has indicated a positive effect on those who learn through educational video games (Randall & Fitch & Simms 1992). Based on research conducted by the University of Central Florida (UCF), immersive educational video games can improve students' math skills and comprehension and raise scores on district-wide benchmark exams (Riedel 2008). Research findings are more consistent in illustrating that, across disciplines, educational games are beneficial to students because they can address different learning styles or preferences, provide immediate feedback, increase student motivation, and enhance a student’s overall learning experience, all of which increase the chance of a positive learning outcome for students (Randel 1992). According to Marshall (2006), “Games expose players to deeply engaging, visually dynamic, rapidly paced, and highly gratifying pictorial experiences that make almost any sort of conventional schoolwork (especially when mediated by a lecture or text) seem boring by comparison” Fitch and Sims (1992) found that those who worked on computers understood it better, viewed it more positively, and related computers to learning more strongly than a group without computer experience did. In another study, Calao & Din (2001) examined the instructional effectiveness of a computer program designed to increase phonological awareness of young children. The treatment groups showed significantly greater gain in phonological awareness than the control groups did. An experiment by Griffith (1983) on a group of primary school students proved that the visual and motor coordination of players of video games was better than that of non-players in the same peer group. To offer more support, Mendiz (2003) outlined a series of procedural objectives that video games help fulfill. Mendiz suggested that video games related to reading by offering a procedural value to promote book reading. Mendiz suggests that video games help in problem solving by proposing strategies and organized elements. Mendiz follows with this procedural outline illustrating the value of gaming in geography by the development of cartography and spatial representations in games (Mendiz 2003).

Key components that discourage video game use in the classroom

Although plenty of research suggests that the use of video games in the classroom provides a beneficial tool for student learning, the incorporation of games in the classroom still creates resistance from professionals (Anderson & Ford 1986 & Rodasta 1998). Rosas (2002) suggests this resistance is based on teachers’ perceptions of games as merely entertaining and not as useful instructional tools, teacher’s lack of knowledge and skills with respect to computer assisted instruction, and insufficient developments of effective educational hardware and software.

Most of the resistance to video games in general revolves around aggression. Rosas (2002) argues that most video games are at least aggressive, if not explicitly violent. This generally involves physical and verbal aggression among main characters. These behaviors are said to cause children to act out in an aggressive manner. Studies on the effect of video game related aggression do show correlations between the use of video games and aggressive behavior. Exposure to violent video games does lead to an aggressive behavior. Studies have shown that children exposed to violent video games show more hostile conduct than those exposed to non violent video games (Ballard & West 1997). The research of (Anderson & Ford 1986) suggests that video games do cause some increase in violent thoughts or feelings as measured by inventories. Schutte, Malouff, Post-Gordon, and Rodasta (1998) offered more evidence with the discovery that there was an increase in violent play in children who played violent games compared to those who played nonviolent games. This evidence is further strengthened by the work of Cooper and Mackie (1986) who found increased amounts of aggressive play in children who played space invaders when compared to children who had not played games. To counter this finding, Graybill, Strawniak, Hunter, and O’leary (1987) found no increases in violent thoughts in children who played violent video games.

Another reason for the resistance to video games in literature is the presence of an immersion effect (Rosas 2002). Video game playing is said to produce an alienating effect over players that hinders social and academic development (Rosas 2002). Squire (2003) further defines some disadvantages such as teacher unfamiliarity with games, short availability compared to traditional teacher materials, expensiveness, poorly developed games with incomplete directions, and limited number of participants. Games perhaps for their anti-authoritarian aesthetics and inherently anti-Puritanical values can be seen as challenging to institutional education (Squire 2003). Prensky (2001) acknowledges that the view of some parents and teachers negative thinking about video game use in the classroom is amplified by the media. Prensky (2001) explains this by citing the press who label most games “killing games”, when in fact two-thirds of all games are rated E for everybody. Many educators express concern about the effects of video games on learners. Provenzo (1991), the most outspoken video game critic expressed four main concerns with video games which included the leading of aggressive behavior, employing stereotyping, promoting individualistic attitudes, and stifling creative play. Provenzo furthers his critique of video games by stating that video games place children in consumer roles, instead of creating their own through play. He argues that children are losing opportunities to develop their creativity by playing video games. Contradicting Provenzo’s work, the largest evidence contradicting this rationale might be over the past two decades, there has been little evidence to suggest that children have grown up without the ability to think creatively (Squire 2003). Squire argues that the studies present in Provenzo’s work are at least two generations behind home console developments.

According to Aguilera (2003) the great majority of officials and opinion leaders have never played video games. This lack of personal experience, together with the caution with which officials treat the products and marketing strategies of the entertainment industry, has in all likelihood contributed to the spread and development of a social discourse that denounces video games across the board.

The current use of video games in education

Although the idea of video games in the secondary education level is somewhat of a new trend, video games have been an effective tool for government and businesses alike (Oblinger 2004). The U.S. Military uses over 50 different video and computer games to teach everything from doctrine to strategy (Prensky, 2003). Recent literature elaborates that the military has explored multiplayer environments, this allowing individuals in different branches of the military, who are geographically dispersed, to participate in the same game. This learning goes beyond mechanics to include interpersonal skills such as how to work as a member of a team, how to assess stress or how to manage risk (Oblinger, 2004).

Some games are already used within the classroom. Some top selling titles such as Sims City, Civilization, and Railroad Tycoon already inform as well as entertain. (Squire 2003). These games fall under the strategy and simulation genres of gaming. Research on the use of Roller Coaster Tycoon in a classroom was constructed by Kirriemuir (2002) who found that the game was appealing to school children, which could be used as a tool in understanding physical concepts such as gravity and velocity. This literature also expressed that this game was successful in crossing different subject domains such as physics and business. Squire (2003) describes how using the game Civilization becomes the impetus for students seeking out more traditional sources of learning material, they illustrate this by describing to win, and students must deal with political, scientific, military and economic issues. Students must synthesize and integrate information from multiple disciplines (Oblinger, 2004).

These literature sources provide an overall glimpse into the research of using video games within the classroom. These sources have provided both negative and positive standpoints on using video games for instructional use in the classroom. The sources have also provided a collage of ideas and trends that are currently taking shape in the field of instruction with video gaming.

References

Aguilera,M.D., & Mendiz, A., (2003). Video games in Education: Education in the Face

Of a Parallel School. ACM Computers in Entertainment, Vol 1 (1).

Anderson, C.A. & Ford, C.M. (1986). Affect of the game player: Short-term effects of

Highly and mildly aggressive video games. Personality and Social Psychology Bulletin, Vol. 12, 290-402.

Baird, W., & Silvern, S. (1990). Electronic games: Children controlling the cognitive

Environment. Early Child Development and Care, Vol. 61, 43-49.

Ballard, M., & Wiest, R. (1995). Mortal Kombat: The effects of violent video technology

On male’s hostility and cardiovascular responding. Indianapolis.

Calao, J., & Din, Feng. (2001), The effects of playing educational video games on

kindergarten achievement. Child Study Journal, Vol 31(2).

Cruickshank, D.R. and Telfer, R. (2001) Classroom Games and Simulations. University

of Newcastle.

Cook, M. (2007). Video Games: A Vehicle for Problem-based Learning*. e-Journal of*

*Instructional Science and Technology*, Vol 10 No. 1 October, 2007.

Cooper, J., & Mackie, D. (1986). Video games and aggression in children. Journal of

Applied Social Psychology, Vol. 16, 726-744.

Ellis, G.J. (1983). Youth in the electronic environment: An introduction. Youth and

Society, 15, 3-12.

Facer, K (2002). Computer Games and Learning: Why do we think it’s worth talking

about computer game and learning in the same breath? Futurelab, 2002.

Feller, B. (2007). Will Video Games Reshape Education? *Microsoft Encarta on-line.*

http://encarta.msn.com/encnet/departments/adultlearning/?article=videogameed

Fitch, J. L., & Sims, J. L. (1992). A microcomputer learning center in Head Start: A pilot

study. Journal of computing in Childhood Education, Vol. 3, 285-292

Graybill. D., Strawniak, M., Hunter, T., & O’Leary, M. (1987). Effects of playing versus

observing violent versus nonviolent video games on children’s aggression. Psychology: A Quarterly Journal of Human Behavior, 24(3), 1-8.

Griffith, J.L., Voloschin, P., Gibb, G.D., and Bailey, J.R. (1983). Differences in eye-hand

motor coordination of video-game users and non-users. Perceptual and Motor Skills. Vol 57, 155-158.

Jenkins, H. (1998). Voices from the combat zone: Game grrlz talk back. In Cassell, J. &

Jenkins, (Ed.), from Barbie to Moral Combat: Gender and Computer Games. Cambridge, MA: MIT Press.

Kirriemuir. J., & Mcfarlane, A. (2002). Use of computer and video games in the

classroom. University of Bristol.

Marshal, M. (2006). Serious Games: Incorporating Video Games in the Classroom.

Educause Quarterly.Vol 29. No. 32006.

Oblinger, D. (2004). The Next Generation of Educational Engagements. Journal of Interactive Media in Education, 2004 Vol. 8

Prensky, Marc. (2003). Digital game based learning. Exploring the Digital generation.

Educational Technology, US department of Education

Prensky, M. (2001). Digital Game-Based Learning, Mcgraw-Hill, New York.

Provenzo, E.F. (1991). Video Kids: Making sense of Nintendo. Cambridge, MA: Harvard.

Quinn, C N (1994) Designing educational computer games in interactive multimedia in

university Education: Designing for change in teaching and learning. Elsevier science BV, Amsterdam, 45-57.

Randel, J.M., Morris, B.A., Wetzel, C.D., & Whitehill, B.V. (1992). The effectiveness of

games for educational purposes: A review of recent research, Simulation and gaming, 23(3), 261-276.

Rieber, L.P. (1996). Seriously considering play: Designing interactive learning

environments based on the blending of microworlds, simulations and games. Educational Technology Research and Development, 44, 43-48.

Riedel, Chris. (2008) Video Games Increase Student Achievement. *The Journal.* On-line

Publication Journal. June 2008.

Rosas, R., Nussbaum. M., Cumsille. P.(2002). Beyond Nintendo: a design and

assessment of educational video games for first and second grade students. Computers and education, Vol. 40, 71-94

Schutte, N.S., Malouff, J.M., Post-Gordon, J.C., & Rodasta, A.L. (1988). Effects of

playing video games on children’s aggressive and other behaviors. Journal of Applied Social Psychology, Vol. 18, 454-460.

Subrahmanyam K. & Greenfield, P.M. (1998). Computer games for girls: What makes

them Play? In Cassell, J. & Jenkins, (Ed.), From Barbie to Mortal Combat: Gender and Computer Games. Cambridge, MA: MIT Press

Sugarman, Tammy & Leach, Guy. (2006). Play to win! Using games in library

instruction to enhance student learning. Science Direct, Vol 20. 191-2003

Squire, K.,Halerson, R., Gee. J., & Williamson. D. (2003). Video games and the future of

learning. Phi Delta Kappan, Vol. 87, No. 2